(No Model.)

H. A. SEYMOUR.

TROLLEY FOR ELECTRIC RAILWAYS.

No. 557,442. Patented Mar. 31, 1896.

Fig. 2.

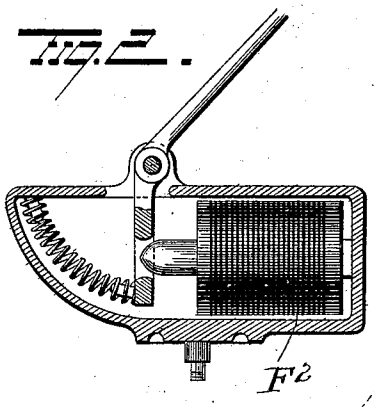

Fig. 1.

Witnesses
E. J. Nottingham
G. F. Downing

Inventor
Henry A. Seymour

UNITED STATES PATENT OFFICE.

HENRY A. SEYMOUR, OF WASHINGTON, DISTRICT OF COLUMBIA.

TROLLEY FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 557,442, dated March 31, 1896.

Application filed February 1, 1896. Serial No. 577,672. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. SEYMOUR, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Electric Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in electric railways, and more particularly to trolley devices therefor.

Heretofore it has been the custom to pivotally connect a trolley-pole to the roof of the car and maintain the trolley-wheel at the free end of said pole against the wire with a necessary degree of pressure by means of strong springs. It has been found in practice that to properly maintain the trolley-wheel in contact with the wire when the car is running a constant pressure of about eighteen pounds is necessary. The use of springs for the accomplishment of this purpose is accompanied by various objectionable features, which, by my improvements, are obviated. The pressure exerted by a coiled spring is not uniform, as its tension varies with the power or force exerted to extend or compress it. The pressure with which a trolley-wheel is forced against a trolley-wire therefore varies as the trolley-pole is turned on its pivotal connection with car and the spring extended or permitted to contract. Should the trolley-wheel run on a slack portion of the trolley-wire, the minimum tension of the spring would be exerted against the pole, and the pressure of the trolley-wheel against the wire at such time would fall below the degree of pressure which it is desired shall be maintained, and if the wire is very slack the result will be that the trolley-wheel will leave the wire. Thus it is apparent that the constant and unvarying degree of pressure which it is important and necessary shall be maintained by the trolley-wheel against the wire in order to insure the continual contact of the wheel with the wire cannot be had or insured by means of springs.

It has not infrequently happened that a trolley-wheel has left the trolley-wire in proximity to a span-wire or other device extending transversely over the track and the trolley-wire, and when the wheel has thus left the trolley-wire the pole has been thrown with great force by the springs against the span-wire, resulting in breaking the trolley-pole or some of its attachments, or the span-wire, or both, and rendering it impossible for the car to proceed until the damage shall have been repaired, thus delaying traffic. These and other objections accompany the use of springs for the purpose stated, and it is the object of my invention to provide simple and efficient means whereby a trolley-wheel can be maintained against the wire with a necessary degree of pressure when the car is running, and so that such pressure shall be removed automatically when the car stops or the trolley-pole meets an obstruction—such, for instance, as a span-wire.

A further object is to so construct trolley devices for an electric car that the trolley-wheel will be maintained against the wire with the necessary pressure when the car is running, solely independent of springs.

A further object is to provide electrical devices which shall be so constructed and arranged as to insure the maintenance of the trolley-wheel against the wire with an adequate and constant pressure.

With these objects in view the invention consists in the combination, with a trolley-pole, of an electromagnetic device so constructed and arranged that when the car is in operation said device will exert a force sufficient to maintain the trolley-wheel against the wire with an adequate degree of pressure to prevent its escape therefrom while the car is running.

The invention also consists in the combination, with a pivoted trolley-pole and means for maintaining the trolley-wheel normally against the wire when the car is not running, of electromagnetic devices constructed and adapted to exert a degree of pressure sufficient to maintain the trolley-wheel in contact with the wire when the car is running; and the invention also consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 illustrates an embodiment of my invention. Fig. 2 is a view of a modification.

A represents the roof of an electric car, and

B the trolley-wire. A revoluble disk or turn-table *a* is mounted on the roof A, and to this disk or turn-table a trolley-pole C is pivotally connected and provided at its free end with a trolley-wheel C′ to run against the trolley-wire B. The trolley-pole C will preferably be made of flexible material and is provided in proximity to its lower pivoted end with a downwardly-projecting arm D, on which a weight E may be adjustably attached. The weight E is intended to slightly more than counterbalance the trolley-pole, so that when the car is not in motion the trolley-wheel will be held in contact with the trolley-wire with merely enough pressure to insure electrical contact.

A solenoid F is located on the turn-table and adapted to actuate a core F′, secured to the arm D. The coil of the solenoid F is included in the motor-circuit, so that when the current is turned on the motor to start the car said solenoid will become energized and actuate its armature with considerable force, thus pulling down the free end of arm D, projecting from the trolley-pole, and causing the latter to turn on its pivot and bend somewhat and the trolley-wheel to press against the wire with a force sufficient to prevent its escape therefrom while the car is running. The parts will preferably be so proportioned that when the solenoid F is energized the trolley-wheel will be pressed against the wire with a pressure of about eighteen pounds. I prefer to use a long pole electromagnet or solenoid; but an ordinary electromagnet F^2, Fig. 2, may be employed, if desired.

From the construction and arrangement of parts above described it will be seen that the necessary pressure of the trolley-wheel against the wire when the car is running is accomplished solely by the electromagnet or solenoid F, and that such pressure is constant and unvarying. Should the trolley-wheel leave the wire while the car is running, the current through the coil of the magnet or solenoid would be immediately broken, the magnet deënergized, and the pressure of the wheel against the wire instantly relieved. Thus it will be seen that should the trolley-wheel leave the wire when the car is in proximity to a span-wire, as above alluded to, the trolley-pole would not be thrown violently against said span-wire, because the pressure which forces the wheel upwardly would have been immediately relieved the instant the wheel left the wire, as above explained. The pole would therefore strike the span-wire very lightly, and being nearly counterbalanced by the weighted arm D said pole will turn on its fulcrum and ride under the span-wire without injury, whereas if springs were used for maintaining the maximum pressure of the wheel against the wire the pole would be thrown violently against the span-wire with the disastrous result hereinbefore mentioned.

It will be apparent from the construction and arrangement of parts above described that the trolley-pole can be turned down when the car is to run under a low place, such as a bridge or into a shed.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a trolley-pole, and means for raising the trolley into contact with an overhead conductor, of an electromagnet adapted to exert sufficient pressure on the trolley-pole to maintain the trolley in good contact with the conductor when the car is running, substantially as set forth.

2. The combination with a trolley-pole constructed to normally raise the trolley into contact, an overhead conductor, of an electromagnet connected with the trolley-pole and adapted to exert sufficient pressure thereon to maintain the trolley in good contact with the conductor when the car is running.

3. The combination with a pivoted trolley-pole constructed to normally raise the trolley into contact with an overhead conductor, of an electromagnet connected with the trolley-pole and adapted to exert sufficient pressure thereon to maintain the trolley in good electrical contact with the conductor when the car is running, substantially as set forth.

4. The combination with a pivoted trolley-pole and a trolley-wheel carried thereby, of a weighted arm projecting laterally from said trolley-pole, an armature connected to said arm and an electromagnet or solenoid adapted to actuate said armature whereby to cause the trolley-wheel to be pressed forcibly against the wire when the car is running, substantially as set forth.

5. The combination with an electric case and a turn-table thereon, of a trolley-pole pivoted to said turn-table and carrying a trolley-wheel, a weighted arm projecting laterally from said pole, an armature or core attached to said arm and an electromagnet or solenoid included in the motor-circuit and adapted to actuate said armature or core, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HENRY A. SEYMOUR.

Witnesses:
C. S. DRURY,
R. S. FERGUSON.